PC-HELPER

PCI Bus Expansion Chassis
Short size, 2-Slots, BLACK

ECH-PCI-CE-H2C

User's Manual

CONTEC CO.,LTD.

Check Your Package

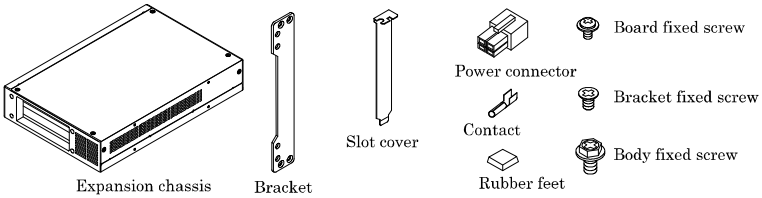
Thank you for purchasing the CONTEC product.

The product consists of the items listed below.

Check, with the following list, that your package is complete. If you discover damaged or missing items, contact your retailer

Product Configuration List

- Expansion chassis…1 [ECH-PCI-CE-H2C]
- This User's Manual (this booklet) …1
- Slot cover …1
- Bracket …2
- Bracket fixed screw …8
- Body fixed screw …4
- Board fixed screw …2
- Power connector …1
- Contact…4
- Rubber feet …4



User's Manual

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1 Before Using the Product

This chapter provides information you should know before using the product.

About the Chassis

This product is an expansion chassis that adds PCI bus slots to a PC. It can add PCI bus slots by connecting an optional expansion adapter (EAD-CE-LPE, EAD-CE-EC). The board that can be mounted is short-type [176.5 (L) x 107 (H) mm] PCI boards.

Features

- PCI bus (5V/32bit 33MHz) slots can be added to your PC.

Two PCI bus (5V/32bit 33MHz) slots can be added.
ECH-PCI-CE-H2C adds two PCI bus slots.
This expansion chassis is connected to a PC using an optional expansion adapter.

- Short-type PCI bus boards can be connected. (ECH-PCI-CE-H2C)

You can connect two short-type [176.5 (L) x 107 (H) mm] PCI boards.
ECH-PCI-CE-H2C can be connected two PCI Boards.

- The best case size design matched to CX100n and the BX100n series.

The design is not ruined by designing the case size matched to CX100n and the BX100n series.

- The cTEST controller realizes further Extensions

Be accessible in cTEST controller CX100n (or BOX computer BX100n) and cable assembly.

Can use it in unification and separate by installing attached insulator bracket.

- A wide range of power supplies (10.8 - 31.2VDC) supported

As the product supports a wide range of power (10.8 - 31.2VDC), it can be used in a variety of power environments.

- The cooler fan can be installed according to the usage.

The cooler fan can be installed according to the usage.

Expansion adapter (Option)

Expansion Adapter for Express Card Slot : EAD-CE-EC
Expansion Adapter for PCI Express Slot : EAD-CE-LPE

Check the CONTEC's Web site for more information on these expansion adapters.

Combinations of Expansion Adapters and Expansion Chassis

The expansion adapters and expansion chassis can be used in the following combinations:

Expansion adapter	Expansion chassis ECH-PCI-CE							
	-H2B	-H2C	-F2B	-H4B	-F4B	-H4A	-H7A	-H13A
EAD-CE-EC	O	O	O	O	O	O	x	x
EAD-CE-LPE	O	O	O	O	O	O	O	O

Expansion Chassis

ECH-PCI-CE-H2B

ECH-PCI-CE-H2C

ECH-PCI-CE-F2B

ECH-PCI-CE-H4B

ECH-PCI-CE-F4B

ECH-PCI-CE-H4A

ECH-PCI-CE-H7A

ECH-PCI-CE-H13A

Expansion Adapter

EAD-CE-EC

EAD-CE-LPE

Accessory (Option)

AC adapter : IPC-ACAP12-04
PCI Express Cable (1m)* : CB-CE-1
PCI Express Cable (3m)* : CB-CE-3
Fan 41x12 : FAN0412

*Need for connect to CX100n, BX100n.

Restrictions

This product is used in a combination with the optional expansion adapter. The following restrictions apply to the situation when the expansion adapter is connected to the expansion chassis.

This product has restrictions on the types of PCs and boards that can be used.
Be sure to check the following restrictions before use.

< Restrictions of PC>

This product uses the PCI-to-PCI Bridge to extend the bus.
The PCI boards plugged in PCI slots in this product are recognized if the PCI-to-PCI bridge is recognized by the BIOS in the PC used. Ask the PC vendor for whether the BIOS recognizes the PCI-to-PCI bridge.

< Restrictions on transfer rate >

When the expansion chassis accommodates a board that performs high-speed transfer such as bus mastering, the overall transfer rate may be lower than that of PCI bus slots in the main unit of a desktop PC.

This is caused by bus extension by the PCI-to-PCI Bridge.

The transfer rate may vary with the system configuration and the type of the PC.

< Restrictions of PCI board>

None of the following boards can be plugged into any expansion slot in this product.

- Video display board (VGA board)
- Board to connect a PCI bus expansion chassis
- Board explicitly stated not to be used with the PCI-to-PCI Bridge
- Some boards, even PCI-compliant ones, may not work depending on their specifications

Customer Support

CONTEC provides the following support services for you to use CONTEC products more efficiently and comfortably.

Web Site

Japanese http://www.contec.co.jp/
English http://www.contec.com/
Chinese http://www.contec.com.cn/

Latest product information

CONTEC provides up-to-date information on products.

CONTEC also provides product manuals and various technical documents in the PDF.

Free download

You can download updated driver software and differential files as well as sample programs available in several languages.

Note! For product information

Contact your retailer if you have any technical question about a CONTEC product or need its price, delivery time, or estimate information.

Limited One-Year Warranty

CONTEC products are warranted by CONTEC CO., LTD. to be free from defects in material and workmanship for up to one year from the date of purchase by the original purchaser.
Repair will be free of charge only when this device is returned freight prepaid with a copy of the original invoice and a Return Merchandise Authorization to the distributor or the CONTEC group office, from which it was purchased.
This warranty is not applicable for scratches or normal wear, but only for the electronic circuitry and original products. The warranty is not applicable if the device has been tampered with or damaged through abuse, mistreatment, neglect, or unreasonable use, or if the original invoice is not included, in which case repairs will be considered beyond the warranty policy.

How to Obtain Service

For replacement or repair, return the device freight prepaid, with a copy of the original invoice. Please obtain a Return Merchandise Authorization number (RMA) from the CONTEC group office where you purchased before returning any product.

* No product will be accepted by CONTEC group without the RMA number.

Liability

The obligation of the warrantor is solely to repair or replace the product. In no event will the warrantor be liable for any incidental or consequential damages due to such defect or consequences that arise from Safety Precautions.
Understand the following definitions and precautions to use the product safely.

Safety Precautions

Understand the following definitions and precautions to use the product safely.

Safety Information

This document provides safety information using the following symbols to prevent accidents resulting in injury or death and the destruction of equipment and resources. Understand the meanings of these labels to operate the equipment safely.

⚠ DANGER	DANGER indicates an imminently hazardous situation which, if not avoided, will result in death or serious injury.
⚠ WARNING	WARNING indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury.
⚠ CAUTION	CAUTION indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate injury or in property damage.

Handling Precautions

⚠ DANGER

Do not use the product where it is exposed to flammable or corrosive gas. Doing so may result in an explosion, fire, electric shock, or failure.

⚠ CAUTION

- Do not plug or unplug any board into or from an expansion slot with the PC or this product powered.
  Doing so may result in a malfunction, overheating, or fault.
  Be sure to turn off the PC or this product and unplug their power cables before plugging or unplugging any expansion board.
- Do not plug or unplug the cable interconnecting the PC and the expansion chassis with the PC or this product powered.
- Do not turn on or off the power switch of this product with the PC powered. Doing so may result in a malfunction.
- The total current consumption by the boards installed in the expansion slots in this product must not exceed the maximum power capacity of its power supply.
  Failure to supply ample power to expansion boards could result in a malfunction, overheating, or fault.
- The external supply voltage or drive current must not exceed the rating.
- Do not connect any signal other than specified to the on-board connector.
  Doing so may result in a malfunction, overheating, fault, or damage.
- When plugging or unplugging the power connector, be sure to hold it by the connector itself.

- Since the expansion chassis is a precision device, do not store or use it where it is subject to shock or vibration. Also avoid any place where the chassis is exposed to direct sunlight, extremely high humidity, or much dust.
- Do not use or store the chassis where it is exposed to any chemical either directly or as vapor in the air.
- The chassis has ventilating slits to prevent it from overheating. Avoid using the chassis with the ventilating slits blocked or in an ill-ventilated place.
- Do not use the chassis near equipment generating a strong magnetic field or noise.
  Doing so may result in a malfunction, overheating, fault, or damage in the chassis, your PC, or both.
- It is very dangerous to use the chassis with water, liquid, or metal (conductive) chips left inside.
  Be careful not to let such foreign matters in the chassis.
- The specifications of this product are subject to change without notice for enhancement or quality improvement.
  Even when using the product continuously, be sure to read the manual and understand the contents.
- Do not modify this product.
  CONTEC will bear no responsibility for any problems, etc., resulting from modifying the product.
- Regardless of the foregoing statements, CONTEC is not liable for any damages whatsoever (including damages for loss of business profits) arising out of the use of or inability to use this CONTEC product or the information contained herein.

FCC PART 15 Class A Notice

NOTE

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference at his own expense.

WARNING TO USER

Change or modifications not expressly approved the manufacturer can void the user's authority to operate this equipment.

Environment

Use this product in the following environment. If used in an unauthorized environment, the chassis may overheat, malfunction, or cause a failure.

Operating temperature

0 - 50°C

Humidity

20 - 80%RH (No condensation)

Corrosive gases

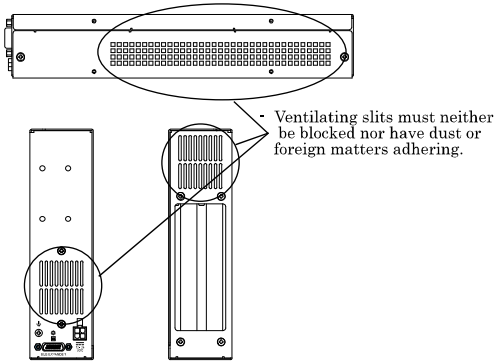
None

Floating dust particles

Not to be excessive

Inspection

Inspect the product periodically as follows to use it safely.



Storage

When storing this product, keep it in its original packing form.

(1) Wrap it in the packing material, and then put it in the box.

(2) Store the package at room temperature at a place free from direct sunlight, moisture, shock, vibration, magnetism, and static electricity.

Disposal

When disposing of the product, follow the disposal procedures stipulated under the relevant laws and municipal ordinances.

2 Setup

This chapter explains how to set up the chassis.

Refer to the user's manual for the expansion adapter EAD-CE-LPE, EAD-CE-EC as required.

What is Setup?

Setup means a series of steps to take before the product can be used.

Taking the following steps in this chapter sets up the ECH-PCI-CE-H2B.

Step 1 Preparation

Step 2 Setup the Hardware

Step 3 Installing the Expansion Board

Step 4 Connecting the Cable

Step 5 Installing the expansion adapter board

Step 6 Setup and Check

If setup fails to be performed correctly, refer to "Setup Troubleshooting".

Step 1 Preparation

Configuration image

The photo is of the EAD-CE-EC+ECH-PCI-CE-H2C

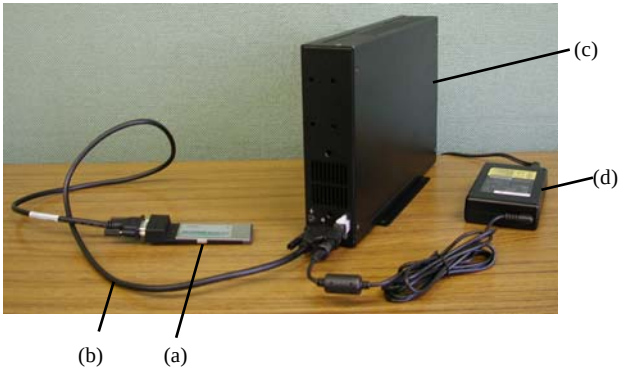
Figure 2.1. Configuration image

Items to be prepared

- PC
- Expansion adapter

  Expansion adapter card…(a),
  Connection Cable …(b)
- Expansion chassis

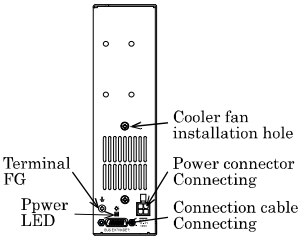
  This product(Chassis)…(c) [Picture is ECH-PCI-CE-H2C.]
  AC adapter…(d)
- PCI board to be installed



Names of major parts

ECH-PCI-CE-H2B/F2B

Front view



Back view

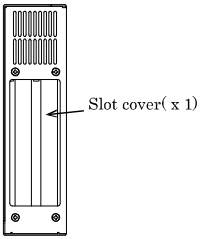


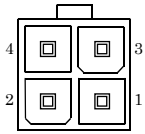
Figure 2.2. Names of major parts < ECH-PCI-CE-H2C >

DC Power Input Connector : DC-IN

To supply the power, always use the power supply listed below.

Rated input voltage : 12 - 24VDC
Range of input voltage : 10.8 - 31.2VDC
Power capacity : 12V 4.0A or more, 24V 1.9A or more

Table 2.1. DC Power Connector

Connector type	9360-04P (mfd. by ALEX)	
	Pin No.	Signal name
	1	GND
	2	GND
	3	12 - 24V
	4	12 - 24V

Applicable connector on the connector side

Housing : 9357-04 (mfd. by ALEX) or 5557-04R (mfd. by MOLEX)
Contact : 4256T2-LF (AWG18-24) (mfd. by ALEX) or 5556 (AWG18-24) (mfd. by MOLEX)

Rise time of power supply

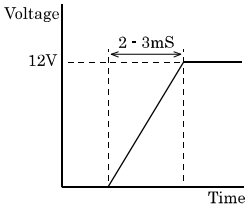


Figure 2.3. Graph of Rise Time of Power Supply

Step 2 Setting up the hardware

- Before you start, be sure that the power is turned off.
- Remove only those screws that are explained. Do not move any other screw.

Attaching the Brackets

The brackets can be used in two ways as illustrated below. ECH-PCI-CE-H2C using the brackets by the appropriate method suitable for the operating environment.

(1) Use screws to attach the bundled attachment fittings with a screw.
Do not tighten screws with excess force.

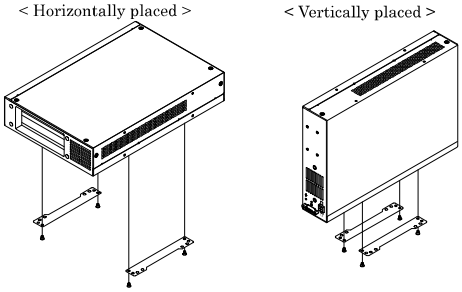


Figure 2.4. Attaching the Brackets

⚠ CAUTION

Screw holes may be damaged if screws are tightened with a torque greater than the specified torque. The specified tightening torque is 5 - 6kgf·cm.

Attaching the FG

(1) Use screws to attach the FG.

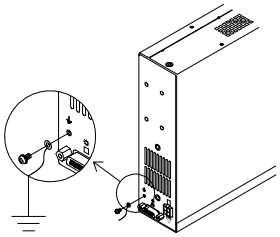


Figure 2.5. Attaching the FG

Attaching the Fan (Option)

Refer to the user's manual for the cooler fan FAN0412 to install its brackets to the expansion chassis.

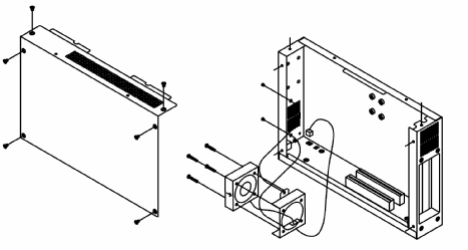


Figure 2.6. Attaching the Fan (Option)

CN2 specification

Table 2.1. Power Connector(CN2) for Cooler Fan

5045-02A (mfd. by ALEX)	
Pin No.	Signal name
1	+12V
2	GND

*Equivalent types are also available.

Applicable connector on the connector side

Housing : 50802-8100 (mfd. by MOLEX)
Contact : 51191-0200 (mfd. by MOLEX)

*Equivalent types are also available.

Installation Orientation

-ECH-PCI-CE-H2C

< Vertically placed > < Horizontally placed >

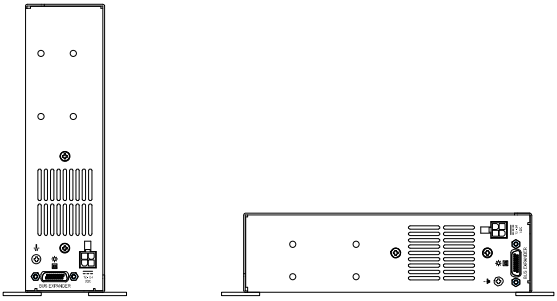


Figure 2.7. Installation Orientation < ECH-PCI-CE-H2C >

-ECH-PCI-CE-H2C + CX100n

< Horizontally placed >

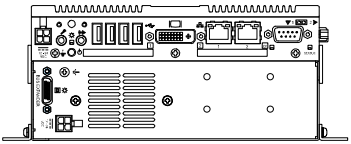


Figure 2.8. Installation Orientation <ECH-PCI-CE-H2C + CX100n >

Step 3 Installing the Expansion Board

⚠ CAUTION

Before installing an expansion board on this product, be sure to turn off your PC or this product and unplug the AC power cables from wall outlets.

Follow the procedure below to install the expansion board on this product.

(1) Unplug the Power connector and Connection Cable from this product.

(2) Remove six screwes from the side panel, then remove the chassis cover.

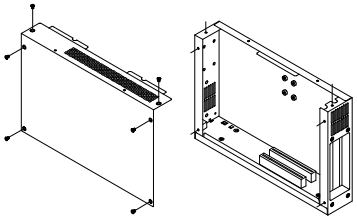


Figure 2.9. Removing the cover

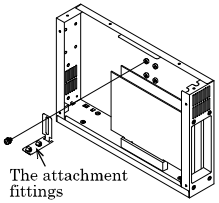


Figure 2.10. Installing the Expansion Board

(3) Plug the expansion board into a PCI slot and fasten the brackets with the attached screw. Apply fasten the bundled attachment fittings with a screw.

Slot covers to unused slots and fasten them with screws.

(4) Put the chassis cover back in place and fasten it with the removed screws.

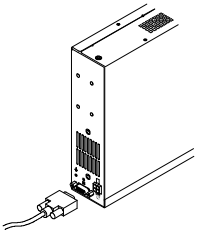
Step 4 Connecting the Cable

Connecting the connection cable to the Expansion Adapter

Refer to the user's manual for the expansion adapter EAD-CE-LPE, EAD-CE-EC to connect its connection cable to the expansion adapter.

Connecting the connection cable to this product

Connect the connector of the connection cable to the connector of this product.



Picture is ECH-PCI-CE-H2C.

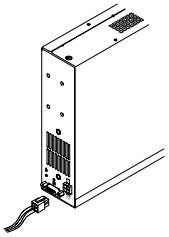
Figure 2.11. Connecting the connection cable to this product

⚠ CAUTION

Do not plug the connection cable into any other connector as doing so can cause a fault.

Connecting the AC adapter

(1) Connect the Power connector to this product.



Picture is ECH-PCI-CE-H2C.

Figure 2.12. Connecting the Power connector of AC adapter

(2) Plug the AC power cable into the AC adapter.

(3) Plug the AC power cable into a wall outlet.

* This product has no power switch.

⚠ CAUTION

Do not connect the Power connector to this product after plugging the AC power cable into the wall outlet, or the expansion chassis may cause a fault.
Connect the AC adapter to this product first, then plug the AC power cable into the wall outlet.

Plugging the AC Power Cable

(1) Please pull the AC power cable out of the wall power outlet.

(2) Please confirm the led on the front panel of expansion chassises is turned off.

(3) Please pull out the AC power cable from AC adaptor.

(4) Please pull out the Power connector from chassis.

⚠ CAUTION

Do not pull out the Power connector from chassis whenAC power cable is still connecting to the wall power outlet. This may cause product malfunction. Please pull out the Power connector from the chassis after unplugging AC power cable from the wall power outlet.

Step 5 Installing the expansion adapter board

Refer to the user's manual for the expansion adapter EAD-CE-LPE, EAD-CE-EC to install the expansion bus adapter on the PC.

Step 6 Setup and Check

Starting the system

This product is turned on and off in power supply.

Turning on the system

(1) Connect the Power connector to this product.

(2) Plug the AC power cable into a wall outlet.

(3) Make sure that the POWER LED on this product is on.

(4) The power supply of a PC is turned ON.

Turning off the system

(1) The power supply of a PC is turned OFF.

(2) Pull the AC power cable out of the wall power outlet.

(3) Pull out the AC power cable from AC adaptor.

(4) Pull out the Power connector from chassis.

⚠ CAUTION

Do not turn on or off this product with the PC main unit powered.
Doing so cancels the detection of the bus adapter. When turning this product on back, restart the PC main unit.

Setting up the hardware in Windows

At startup of Windows, the PCI-to-PCI Bridge used by this product are detected in sequence and identified automatically by the Windows standard driver.

After that, the PCI boards installed on this product are detected in sequence.

For setting up and checking the boards used on the expansion chassis, refer to their respective manuals.

Checking the hardware in Windows

You can use Device Manager to check whether this product has been identified in Windows. Device Manager shows “PCI standard PCI-to-PCI bridge” under “System devices”.

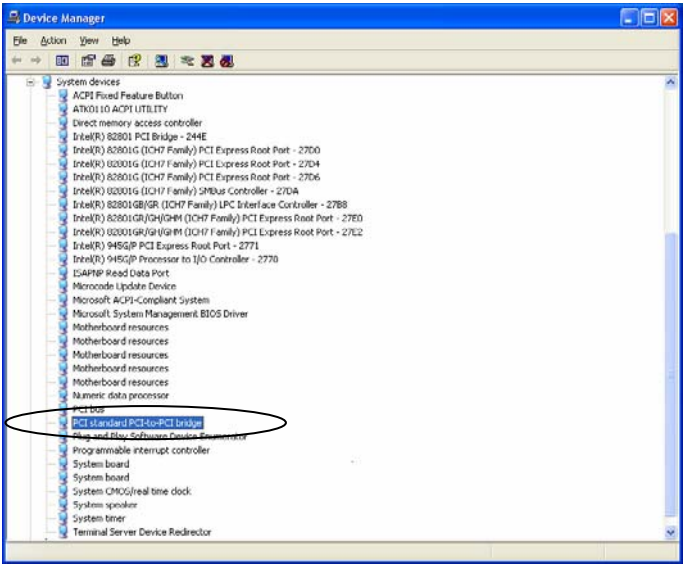

Device Manager
File Action View Help
System devices
ACPI Fixed Feature Button
ATK0110 ACPI UTILITY
Direct memory access controller
Intel(R) 82801 PCI Bridge - 244E
Intel(R) 82801G (ICH7 Family) PCI Express Root Port - 27D0
Intel(R) 82801G (ICH7 Family) PCI Express Root Port - 27D4
Intel(R) 82801G (ICH7 Family) PCI Express Root Port - 27D6
Intel(R) 82801G (ICH7 Family) SMBus Controller - 27DA
Intel(R) 82801GB/GR (ICH7 Family) LPC Interface Controller - 27B8
Intel(R) 82801GR/GH/GHM (ICH7 Family) PCI Express Root Port - 27E0
Intel(R) 82801GR/GH/GHM (ICH7 Family) PCI Express Root Port - 27E2
Intel(R) 945G/P PCI Express Root Port - 2771
Intel(R) 945G/P Processor to I/O Controller - 2770
ISAPNP Read Data Port
Microcode Update Device
Microsoft ACPI-Compliant System
Microsoft System Management BIOS Driver
Motherboard resources
Motherboard resources
Motherboard resources
Motherboard resources
Motherboard resources
Numeric data processor
PCI bus
PCI Standard PCI-to-PCI bridge
Programmable interrupt controller
System board
System board
System CMOS/real time clock
System speaker
System timer
Terminal Server Device Redirector

Figure 2.13. Sample screen shot of Device Manager

Connecting the CX100n

Connectting the CX100n

(1) Remove four screws (ECH-PCI-CE-H2C, CX100n).

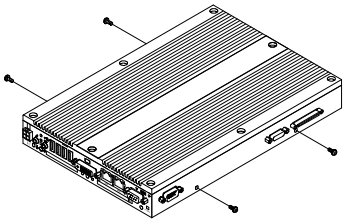


Figure 2.14. Removing the screws (CX100n)

(2) Fasten the Brackets with attached Brackets fixed screwes.

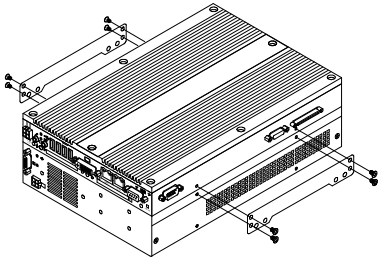


Figure 2.15. Attaching the Brackets

Installation Requirements

Be sure that the ambient temperature is within the range specified in the installation environment requirement by making space between the product and device that generates heat or exhaust air.

Distances between this product and its vicinity

⚠ CAUTION

- When using this chassis connected with CX100n, keep it at least 20mm away from any object such as the wall for cooling purposes.
- Attaching rubber feet to the chassis makes it 3.6mm taller.

- ECH-PCI-CE-H2C connected with CX100n

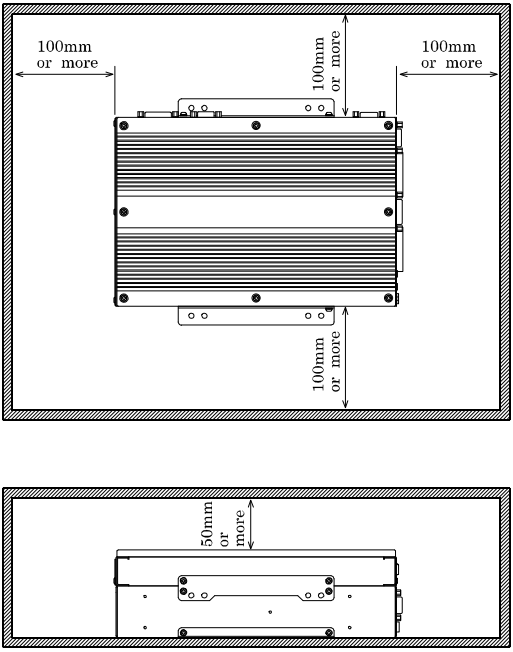


Figure 2.16. Distances between this product and its vicinity. < ECH-PCI-CE-H2C + CX100n >

⚠ CAUTION

Do not install this product into the fully-sealed space except the case in which the internal temperature is adjustable by equipment such as air conditioner. Troubles such as operational malfunctions could be occurred by the temperature increase caused by long-term usage.

Setup Troubleshooting

Please confirm followings when the ECH-PCI-CE-H2C does not work.

Symptoms and Actions

The chassis won't be turned on.

a. Make sure that the Power connector has been connected correctly.

b. Make sure that the AC power cable has been connected correctly.

c. Make sure that the power supplies of the PC or this product are on.

d. Make sure that you have followed the procedure in Chapter 2.

e. Even though the chassis is still not turned on, check whether it is turned on with no board installed. If the chassis is turned on with no board installed, check the total current consumption by the installed boards. The total current consumption must not exceed the power capacity of this product.

No PCI board on this product is detected.

f. Make sure that the expansion adapter has been installed correctly.

g. Make sure that the connection cable has been installed correctly. When connecting the connection cable to the main chassis, insert the connector until it clicks into place.

h. Make sure that the POWER LED on this product is turned on.

The photo is of the EAD-CE-EC + ECH-PCI-CE-H2C. + IPC-ACAP12-04

3 About Hardware

Hardware specification

Table 3.1. Specification

Item		ECH-PCI-CE-H2C
Compatible bus		PCI Local Bus Specification Rev2.3 (+5Vtype)
Address space		32bit memory address, I/O address
Interrupt level		INTA - INTD
Bus operating clock		33MHz (Max.)
Number of user-available slots		2 slots (short size)
Acceptable board sizes (mm)		176.5(L) x 107(H)
Power supply		
	Expansion slot supplied power (The output current must not exceed the value on the right.)	+5VDC 5A (Max.) +3.3VDC 2A (Max.) +12VDC 1A (Max.) -12VDC 0.3A (Max.)
	Maximum total power capacity	48W
	Rated input voltage	12 - 24VDC
	Range of input voltage	10.8-31.2VDC
	Power consumption	12V 4.0A(Max.), 24V 2.0A(Max.)
Outside dimensions(mm)		270.0(W) x 182.0(H) x 50.0(L) (without rubber feet)
Weight		3.5 kg

Outside dimensions of acceptable board (Max.)
< ECH-PCI-CE-H2C >

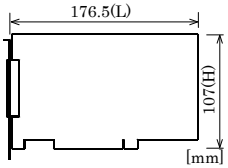


Table 3.2. Environmental specification

Item		Specification
Operating temperature		0 - 50ºC
Operating humidity		20 - 80%RH(No condensation)
Storage temperature		0 - 60ºC
Storage humidity		10 - 90%RH(No condensation)
Floating dust particles		Not to be excessive
Corrosive gases		None
Line-noise resistance	Line noise	AC line / ±2kV Signal line / ±1kV (IEC61000-4-4 Level 3,EN61000-4-4 Level 3)
	Static electricity resistance*1	Contact discharge / ±2kV (IEC61000-4-2 Level 1, EN61000-4-2 Level1
		Atmospheric discharge / ±4kV (IEC61000-4-2 Level 2, EN61000-4-2 Level 2)
Vibration resistance	Sweep resistance*1	10 - 57Hz / semi-amplitude 0.075 mm, 57 - 150Hz/1.0G 40 min. each in x, y, and z directions (JIS C60068-2-6-compliant, IEC60068-2-6-compliant)
Impact resistance		10G, half-sine shock for 11 ms in x, y, and z directions (JIS C60068-2-27-compliant, IEC60068-2-27-compliant)
Grounding		Class D grounding (previous class 3 grounding), SG-FG / continuity

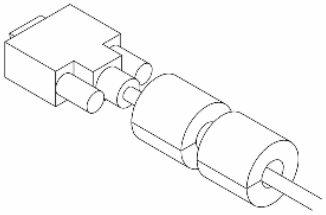
*1: It is provided with "PCI Express® External Cabling Specification".

⚠ CAUTION

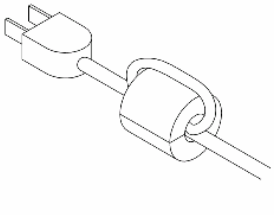
- If you use this product in a noisy environment, the ferrite core must be installed in the PCI Express cable at a position near the main body of this product side connector and in the AC cable at a position near the plug of AC Adapter. For the type of ferrite core, refer to the following table (Equivalent types are also available.)

Name	Maker	Turn
FRC2009A-6 or E04SR200935A	CONTEC or SEIWA	1~2

When attaching a ferrite core to the cable, coil it around 0-1 times near the connector while leaving it open, and then close it.



PCI Express cable [Turn :1] x 2pcs



AC power cable [Turn :2] x 1pc

Physical Dimensions

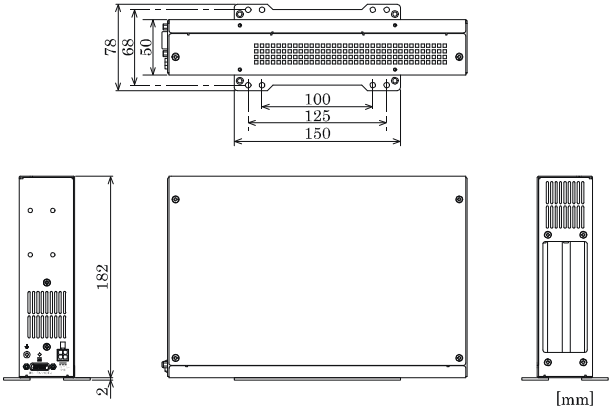


Figure 3.1. Outside Dimensions < ECH-PCI-CE-H2C Vertically placed >

* When you fasten the bundled brackets to be fixed to the body, you should use the attached screws (M4 x 10).

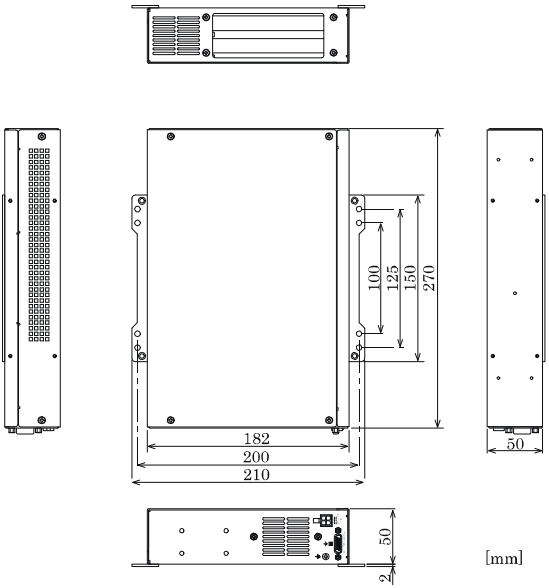


Figure 3.2. Outside Dimensions < ECH-PCI-CE-H2C Horizontally placed >

* When you fasten the bundled brackets to be fixed to the body, you should use the attached screws (M4 x 10).

⚠ CAUTION

When using this chassis, keep it at least 20mm away from any object such as the wall for cooling purposes.

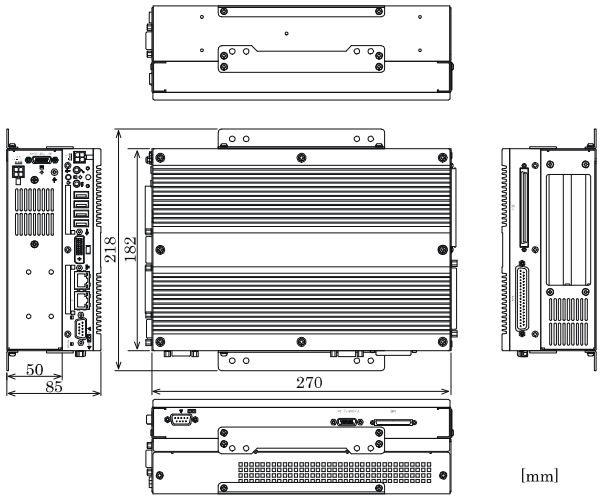


Figure 3.3. Outside Dimensions < ECH-PCI-CE-H2C + CX100n >

⚠ CAUTION

When using this chassis, keep it at least 20mm away from any object such as the wall for cooling purposes.

ECH-PCI-CE-H2C

User's Manual

CONTEC CO., LTD.

September 2011 Edition

3-9-31, Himesato, Nishiyodogawa-ku, Osaka 555-0025, Japan
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09062011_rev3

Management No. NA01138
Parts No. LYME533